

WHAT IS CLAIMED IS:

- 1) A method for extended storage of reduced glutathione in solution, comprising the steps of:

- a) dissolving a predetermined quantity of reduced glutathione in an aqueous medium having a pH of between 5.0 and 8.0 to produce a reduced glutathione solution having a predetermined initial concentration $[A]_0$, wherein, when the ratio $[A]/[A]_0$, where $[A]$ is the actual glutathione concentration at time t , is plotted as a function of time t , the concentration of reduced glutathione decreases over time in a linear fashion with a temperature-dependent slope; and
- b) storing the reduced glutathione solution at a predetermined temperature which is above a freezing point of the solution and below 15°C , so as to maintain the rate of reduced glutathione decay at between 0 % and 5% of the predetermined initial concentration per month.

- 2) A method according to claim 1, wherein storage at said predetermined temperature causes a reduction in a rate constant for dimerization of reduced glutathione G-SH to form oxidized glutathione G-SS-G.

- 3) A method according to claim 1, where the initial concentration of reduced glutathione is between 10 mg/ml and 400 mg/ml.

- 4) A method according to claim 1, wherein the predetermined temperature is 5°C .

- 5) A method for extended storage of reduced glutathione in solution, comprising the steps of:

- a) dissolving a predetermined quantity of reduced glutathione in an aqueous medium having a pH of between 5.0 and 8.0 to produce a reduced glutathione solution having a predetermined initial concentration, wherein the concentration of reduced glutathione decays over time in a linear fashion;

- b) storing the reduced glutathione solution at a predetermined temperature which is above a freezing point of the solution and below 15°C, so as to maintain the rate of reduced glutathione decay at between 0% and 5% of the predetermined initial concentration per month.

5 6) A method according to claim 5, where the initial concentration of reduced glutathione is between 10 mg/ml and 400 mg/ml.

7) A method according to claim 1, wherein the predetermined temperature is above a freezing point of the solution and below 10° C.

8) A method according to claim 1, wherein the predetermined temperature is 5° C.

10 9) A method for extended storage of reduced glutathione in solution, comprising the steps of:

a) dissolving a predetermined quantity of reduced glutathione in an aqueous medium having a pH of between 5.0 and 8.0 to produce a reduced glutathione solution having a predetermined initial concentration [A]₀;

b) reducing the temperature of the reduced glutathione solution to a predetermined temperature which is sufficiently low to prevent oxidative dimerization of glutathione without freezing the aqueous medium; and

c) storing the reduced glutathione solution at the predetermined temperature.

15 10) A method for treating a patient with Parkinson's disease with reduced glutathione while minimizing the risk of oxidative stress on the brain, comprising the steps of:

a) dissolving a predetermined quantity of reduced glutathione in an aqueous medium having a pH of between 5.0 and 8.0 to produce a reduced glutathione solution having a predetermined initial concentration [A]₀;

20 b) reducing the temperature of the reduced glutathione solution to a predetermined temperature which is sufficiently low to prevent oxidative dimerization of glutathione without freezing the aqueous medium;

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- c) storing the reduced glutathione solution at the predetermined temperature;
and
- d) administering the reduced glutathione to the patient with Parkinson's disease.

5 11) A method for treating a patient with emphysema with reduced glutathione, comprising the steps of:

- a) dissolving a predetermined quantity of reduced glutathione in an aqueous medium having a pH of between 5.0 and 8.0 to produce a reduced glutathione solution;
- b) reducing the temperature of the reduced glutathione solution to a predetermined temperature which is sufficiently low to prevent oxidative dimerization of glutathione without freezing the aqueous medium;
- c) storing the reduced glutathione solution at the predetermined temperature;
and
- d) administering the reduced glutathione to the patient with emphysema.